ENGBO ANCHOR WINDLASS

Installation and user manual

MINI 101
MIDI 201

CE 0470

Rev.:4
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According to NS-EN ISO 9001:2000

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ENGBO AS – *an Engbo Group Company*

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TABLE OF CONTENTS

TABLE OF CONTENTS *2*
Introduction *3*
Brief description of MINI 101 and MIDI 201 ..... *3*
Preparations before anchoring **4**
Wiring *6*
Switch panel for fixed installation **6**
Connection of switch panel **6**
Connection of auto stop detector **7**
Connection of motor leads and battery cables **7**
Connection of battery **7**
Wiring diagram **8**
Installation instructions *8*
General **8**
Use of anchor bracket **8**
Stern penetrations **8**
Fixed anchor bracket or hinged anchor bracket **8**
Cover with rollers for hole **8**
Inserting the rope into the windlass gypsy **10**
Rope around the gypsy **11**
Minimum rope clearance - height under windlass **12**
Installation of stop ring for auto stop **12**
Battery replacement **14**
Retrofit of remote control **14**
Coding the wireless remote control **15**
Procedure for wireless remote controls with serial no. above 8600 15
How to put the wireless control unit in code mode: 15
How to put the receiver unit in code mode: 15
Maintenance *16*
Winter storage **16**
Dimensioned drawings **16**
Technical data **17**
Trouble-shooting MINI 101 and MIDI 201 ..... **18**

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Introduction

Congratulations on your new windlass and thank you for selecting an Engbo windlass. We hope your windlass will meet your expectations. Please note that this requires that the windlass be installed and used in accordance with this manual in an environment with the correct conditions for proper operation. This includes the necessary voltage capacity for the windlass motor as well as correct placement of windlass, rope, anchor and anchor bracket.

Brief description of MINI 101 and MIDI 201.

Engbo **MINI 101** is designed for boats up to approximately 20 feet and Engbo **MIDI 201** is designed for boats up to approximately 25 feet. These windlasses are true free-fall windlasses and equipped with **transistor-based power electronics** that replaces the traditional relay. The new electronics have no open contacts and are very flexible as regards voltage. Engbo **MINI 101** and **MIDI 201** are also equipped with **integrated radio receiver** for the wireless remote control as well as an integrated system for protection of the windlass motor and electronics module.

The windlasses are supplied with a standard switch panel. A wireless remote control with a range of up to 30 m under normal conditions can also be used.

NOTE. Familiarise yourself with the information in this manual before installing the windlass. Make sure you study it carefully.

General procedure for use of Engbo windlasses.

Read the entire operating instructions carefully before using the windlass.

Please remember that large forces are involved. Use common sense when operating the windlass and make sure that:

- Fingers do not become entangled in rope/chains, anchor, rollers or gypsy.
- Rope is monitored at all times when hoisting the anchor.
- Everyone on board is informed about how to operate the windlass. Children do not operate the windlass
- The windlass is always operated from a location with full overview when raising the anchor. This is necessary in case the anchor gets caught on something that may damage the boat.
- If the windlass works hard when raising the anchor, release the button for a moment. When the boat has started moving backwards, start the windlass again. This will ensure that the windlass will work less hard and draw less current.
- If the anchor is stuck on the bottom, pay out some rope and fasten it to a cleat in the boat. Use the boat to loosen the anchor. When the anchor is loose, use the windlass in the normal manner.
- The windlass is operated for a maximum of 3 minutes with a normal load
- The anchor is **always secured** to the boat when sailing. The enclosed safety line is intended for this purpose.
- The power to the windlass is turned off when the boat is sailing.
- The windlass is operated with care to avoid unnecessary damage/injury.
- There is sufficient battery power when operating the windlass. **Always** keep the motor running while using the windlass.
- If the electronic overload protection has been triggered and the windlass cannot be operated, let it cool down for approximately 15 min and try again. In an emergency, the overload protection can be overridden by turning the windlass main switch off and on again.
- Engbo AS is not responsible for injury or damage as a result of the use of the windlass.

NOTE!

- ***Always keep the boat's motor running when operating the windlass.***
- ***Always turn of the power to the windlass when it is not being operated.***
- ***Always make use of original Engbo anchor line.***
- ***Always make sure the anchor has hit the sea bottom before pushing the "up" button.***
- ***Windlass and accessories must be installed and used in a manner that will not result in damage or injury to human beings, boats or surroundings.***
- ***The installation must be carried out or checked by people with expert knowledge of high current, low voltage.***

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Preparations before anchoring

Engbo MINI 101 and MIDI 201 has a true free-fall anchor drop function. One press of the button and the anchor drops freely to the bottom. The anchor should be dropped a distance from where the boat will be located corresponding to 3-5 times the water depth.

Dropping anchor

- Keep the boat's motor running during the anchoring operation.
- Find the best location for dropping the anchor.
- Check that the anchor safety line has been released.
- Turn on the windlass main switch.
- When the windlass main switch has been turned off, you **must** always press the down switch first. This must be held in for at least 1 second to drop the anchor.
- The windlass motor will then pay out for 1.5 seconds to ensure correct free-fall function.

Fixed switch panel

- Press the down switch for at least 1 sec.
- The anchor is released.
- The windlass is now disengaged and the rope will be paid out as the boat drifts towards shore.
- Moor the boat to the shore.
- Tighten the anchor rope by pressing the up switch to fasten the anchor to the bottom and pull the boat away from shore.

Note: *The windlass will always retract at low speed for 1 sec. before increasing to full speed. By holding down the switch less than 1 sec. and pressing it again (and repeating this procedure as often as necessary), the windlass will keep operating at low speed.*

Hoisting anchor

- Start the boat's engine to charge the battery.
- Check that the windlass main switch is turned on.
- Let go of the mooring to land.
- Activate the windlass.

Keep pressing the up switch and the windlass will pull the boat away from shore. The windlass will lift the anchor at full speed until the first **auto stop** is activated (Midi 201).

Note*: Applies to rope windlasses* ***ONLY*** *and assumes correct fitting of stop ring on the anchor rope, and correct installation of the stop sensor.*

Important! *Keep an eye on the anchor as it comes out of the water and enters the anchor bracket to ensure you can stop the windlass to avoid damage if the anchor has pulled objects from the bottom.*

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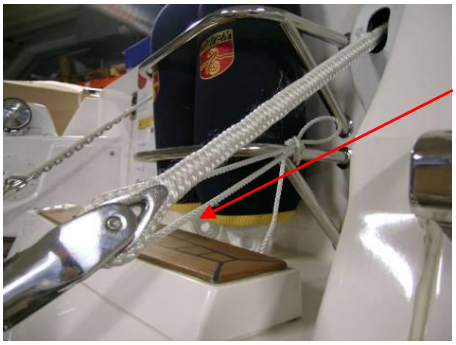
***Note**: If the windlass pulls heavy, it will be sensible and save electricity to let the windlass rest for some periods. When the boat starts moving backwards, let go of the switch for a while, for then to operate the windlass again. Repeat as necessary.*

- Release the up switch, press it again and hold it down.
- The windlass will lift the anchor further at low speed until the second auto stop is activated and the windlass comes to a full stop.
- The anchor is now resting correctly in the anchor bracket.
- Fasten the safety line to the anchor.
- Turn off the windlass main switch.
- Bon voyage!



Wireless remote control

The remote control is a splash proof unit that will float in the water. The range is more than 30 m under normal conditions. The Engbo remote control is a high quality, narrow band unit with two-way communication with the electronics unit. Each unit has a unique code.
It uses three standard AAA (LR03) batteries (included).
It has anti-slip strips on the back.
The batteries will normally last more than two seasons.
One remote control can be used to operate two windlasses.

***Note!** The remote control must be coded before use.*
See procedure in another section of the manual.

- The remote control is activated by pressing one of the switches for 1 seconds. The power indicator will then turn green and a short beep sounds.
- All subsequent use of switches is shown on the associated indicator above the switch and indicated by a short sound.
- To ensure longer lifetime, the remote control will automatically turn itself off five minutes after the last button was pushed. This deactivation is signalled with two short sound bursts and blinks in the power indicator.

Anchor down

- When the remote control has been **activated**, the anchor can be dropped by pressing the down button**.** The switch must be held in for at least 1 second to drop the anchor.
- The windlass will then pay out for 1.5 seconds to ensure correct free-fall function.

Anchor up

- When the anchor has been dropped and is on the bottom, it can be lifted by pressing the up switch. The windlass will retract for as long as the switch is held down. If the remote control has been deactivated (if more than five minutes has elapsed since the last button activation), it will first be activated and then immediately start reeling in the anchor. The windlass always starts with 1 second at low speed before increasing to full speed.
- The windlass can also be operated at low speed by pushing and releasing the button several times as required.

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The power indicator provides the following information:

- **Green light** shows that the remote control is ready for use.
- **Orange light** indicates that the voltage to the windlass is not optimum or that the windlass is overloaded and need to cool down.
- **Red light** blinking rapidly indicates a system fault or that the battery voltage is insufficient to allow operation of the windlass.
- **Red light blinking** slowly together with short sound signals indicate no radio contact with the electronic unit (receiver).

NB! These error indications are shown when out of range.

NB! The remote control shown to the left may be used for both bow and stern windlasses as well as bow and stern thrusters.

NB! Forced operation of the windlass

If the anchor needs to be retracted a little further after the second auto stop, press the up button on the touch panel or remote control for more than 10 seconds. The windlass will then operate at very low speed for as long as the button is held down.

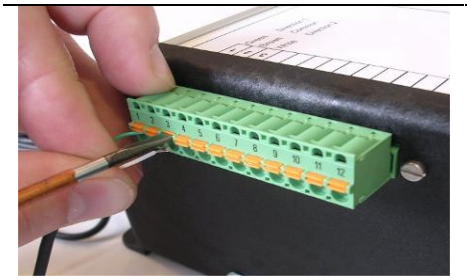
NB! This operation must only be carried out under very controlled circumstances to prevent damage.

Wiring

The label on top of the electronics module also shows the wiring of the unit.
All wiring and connections must be done with the main switch turned off or the battery disconnected.

Switch panel for fixed installation

- Watertight (IP 68) switch panel for installation exposed to sea spray and sun.
- Designed to allow installation directly on slightly curved surfaces as well (two-sided tape). The enclosed screws may also be used.
- An optional adapter plate can be used for installation in existing 62 x 62 mm hole.
- Several panels can be connected in parallel to the same electronics unit.



MCU – Motor Control Unit

Connecting the switch panel to the MCU

One switch panel is supplied as standard with a 10-m cable. The wires are cut and the insulation stripped to the correct length and connected by pushing the wires in while holding down the orange button above the selected holes. Release the button when the wire is in place. Check to make sure that the insulation is not inside the terminal and that there are no loose strands sticking out.
The wires must be connected as follows:
1: White
2: Brown
3: Green
If more than one panel is to be installed, connect the wires in parallel to 1, 2 and 3. (2 is common 0 V)

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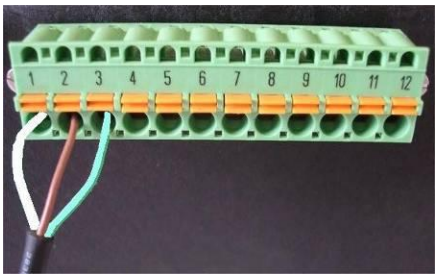
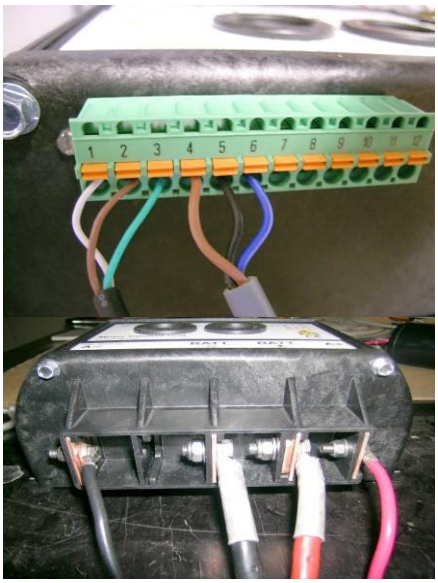


Terminal strips with spring locks are used to avoid wires coming loose due to vibration or temperature changes.

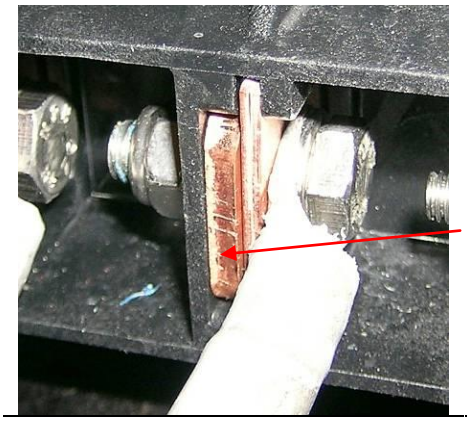


Connection of auto stop detector

(Note. MIDI 201 ONLY)
The wires from the end stop device are connected as described above.
The wires must be connected as follows:
4: Brown (BN) = +V
5: Black (BK) = Signal
6: Blue (BU) = Gnd

Connection of motor leads and battery cables

The preferred method is to first fit the cables on the unit before installing it standing against the bulkhead with the power cables pointing downward. The motor leads are supplied fitted on the motor.
Go left to right. Connect the motor's black negative lead to the left before the battery's black negative cable, then the battery's positive cable and finally the motor's positive lead. (Disassemble in opposite order if necessary.)
The picture shows the correct connection and orientation of bolts and cables (the lock nuts on the left side).
(The cable terminals must connect directly to the copper rails without any washers, etc. in between. Use a flat washer between the bolt head and the top of the cable terminal and between the composite side of the end wall and lock nut.)
The M8 x 25 mm bolt is for the battery's positive conductor.
Note the copper plate used as a spacer in the end wall.
For normal distances from the battery to the electronics module (< 4 m), use 25 mmP^{2P} for MINI 100 and 35 mmP^{2P} for MIDI 201. If the distance is longer, use the next larger standard cable dimension.



WARNING!

Connection of battery

- ***Incorrect battery polarity will <u>permanently</u> damage the power electronics.***
- *Make sure no cables are short-circuited or damaged before connecting the battery.*
- *Check all power cables and connections, retighten if necessary.*
- ***<u>Never</u>** use washers **<u>between</u>** cable terminals and terminal points with high current.*
- *The battery's positive cable must have a fuse as close to the battery as possible and the main switch must be installed in an accessible location before the electronics unit.*
- *The windlass must **<u>always</u>** <u>be connected to the start battery</u>.*

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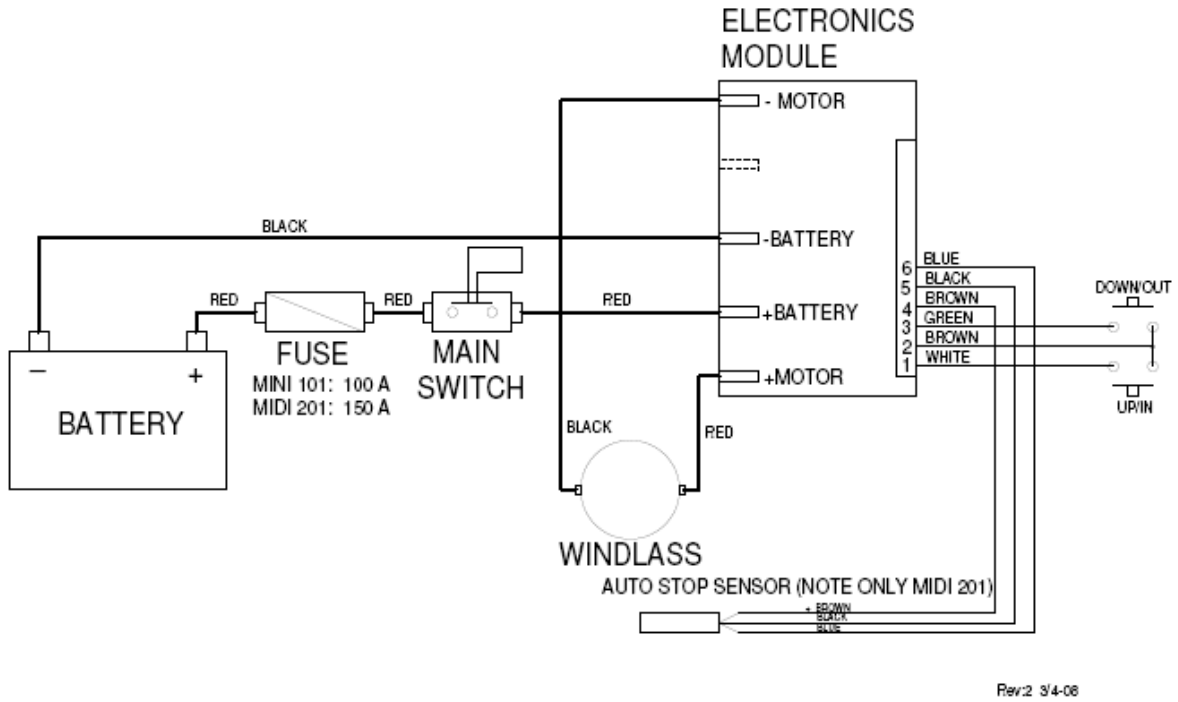
Wiring diagram



NOTE! The windlass must be connected to the boat's start battery and connected after the boat's main switch.

Installation instructions

General

Locate the windlass as high as possible to allow plenty of room for rope below the windlass. The height from lower edge of the gypsy should be at least 40 cm above the bottom of the rope locker or where the rope will be placed. This is to allow room for 50 metres of 12 mm plaited Engbo anchor rope. If the height is less than 40 cm, make sure the rope does not pile all the way up to the windlass. If this is the case, use a shorter rope. The windlass should be installed far enough to the centre of the stern that the anchor does not drag in the wave curving in right behind the boat.

Use of anchor bracket

The bracket for the rope must be installed with the sheaves outside the platform to ensure the anchor/rope clears the platform.

Stern penetrations

Make sure the hole in the hull is located correctly based on the direction of the rope. To avoid unnecessary wear and tear the rope should not touch the sides of the hole vertically or horizontally, and the hole must be elliptical vertically to allow for rope movement on the roller when windlassing. Rope guide (68-00008 or 39-73000) is recommended.

Fixed anchor bracket or hinged anchor bracket

If the windlass must be installed so low in relation to the swimming platform that it will pull the anchor forward/inward rather than upward/inward, it is preferable to use our hinged anchor bracket (see catalogue).

Cover with rollers for hole

If it proves difficult to route the rope straight vertically from the gypsy to the anchor roller, it may be beneficial to use a cover with rollers with hole (68-00008) to allow for the rope angle.

NOTE! Remember to fasten the rope inside the boat.

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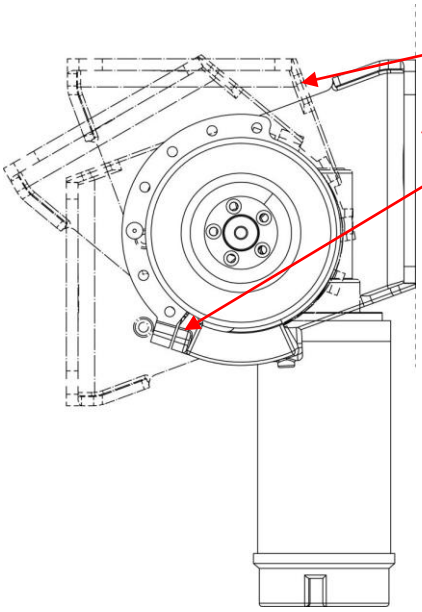
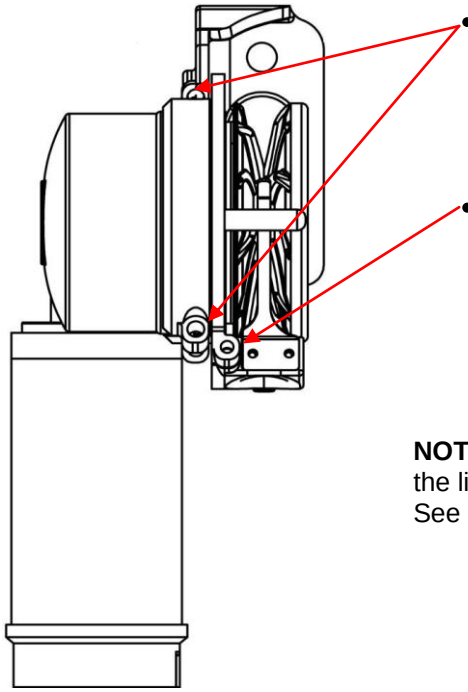
Installation

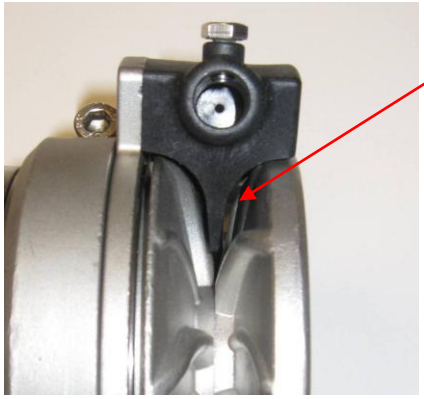


- The mounting bracket for MINI 101 and MIDI 201 allows for infinitely variable rotation in relation to the windlass gear/motor.
- The bracket for the rope guide/deflector can also be rotated independently of the gear/motor and mounting bracket.
- This allows for installing the windlass on surfaces with different angles in relation to the stern. It can be fitted on the inside of the stern, hanging below the deck or aft of cross bulkheads inside the boat.



- Position the windlass mounting bracket by loosening the two screws fastening the bracket to the gear housing, rotate the windlass to the correct position and tighten the screws.
  Note: Max. tightening torque 17 Nm.
- Adjust the windlass rope guide bracket in a corresponding manner by loosening the screw fastening it to the gear housing. Rotate the bracket so that the rope is guided down and away from bulkheads and components that prevent the rope from coiling correctly below the windlass.
  Note: Max. tightening torque 7 Nm.

NOTE! It is important that the rope is wound sufficiently around the line wheel to ensure a good grip on the rope.
See separate section.



NOTE!
The ”line guide” must be located in centre of the line wheel. Also check this after having tightened the fixing screw.

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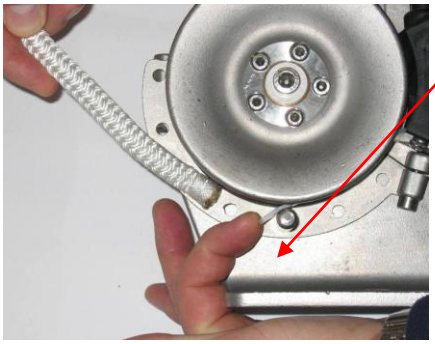
Inserting the rope into the windlass gypsy



Insert the rope into the gypsy between the gypsy and the rope guide. It may be easier if the tip of the rope guide is splayed carefully.

Route the rope via the gypsy and out through the hole in the rope deflector.

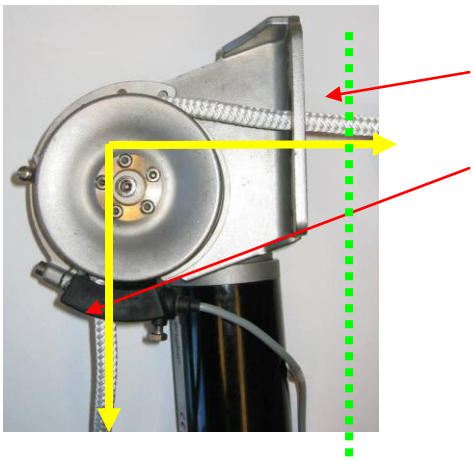
If the windlass is connected, the rope can be pulled by pressing down on the up button on the touch panel or remote control.

Note: Be careful to avoid injuring fingers.

When the tip of the rope has been pulled through the rope deflector, the rest of the rope can be pulled through using the windlass.

Make sure the windlass reels as intended.

Rope around the gypsy



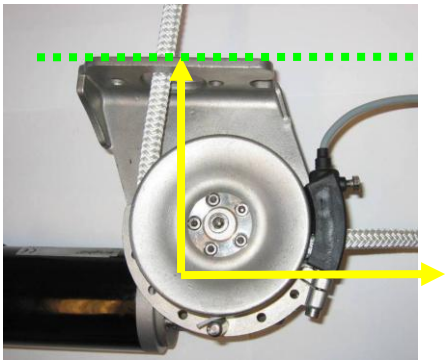
The mounting bracket for MINI 101 and MIDI 201 allows for infinitely variable rotation in relation to the windlass gear/motor.

The bracket for the rope guide/deflector can also be rotated independently of the gear/motor and mounting bracket. See separate description.

This description is for installation of the windlass on a vertical cross bulkhead, on the inside of the stern, for example. The green broken line indicates the bulkhead that the windlass is fastened to.

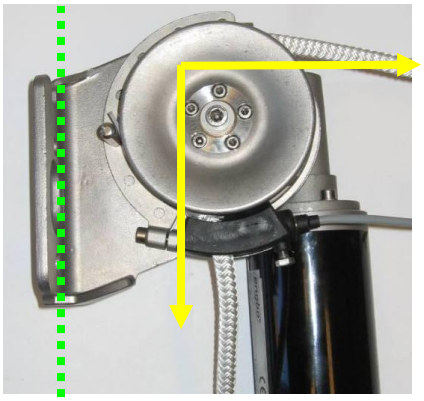
It is important that the length of rope in contact with the gypsy is sufficient to ensure good engagement with the rope. Yellow arrows.

Note! Regardless of how the windlass is fastened to the boat, the angle between where the rope enters and leaves the gypsy must be minimum 90°.



This illustration indicates the windlass fastened below deck, etc. The windlass mounting bracket has been rotated 90° counter-clockwise compared with the illustration above.

The rope comes from above and goes down into the gypsy. In this case, the rope guide must be adjusted to ensure the rope is pushed out horizontally from the windlass.



This shows the windlass installed on the aft side of an inboard cross bulkhead.
The windlass mounting bracket has been rotated 180° counter-clockwise compared with the illustration on previous page, top of chapter.

NOTE! The rope is alway pulled into the windlass from the right. This is because of the direction of rotation for the windlass gypsy.

NOTE! Make sure there is sufficient room to stow the rope below and next to the windlass.

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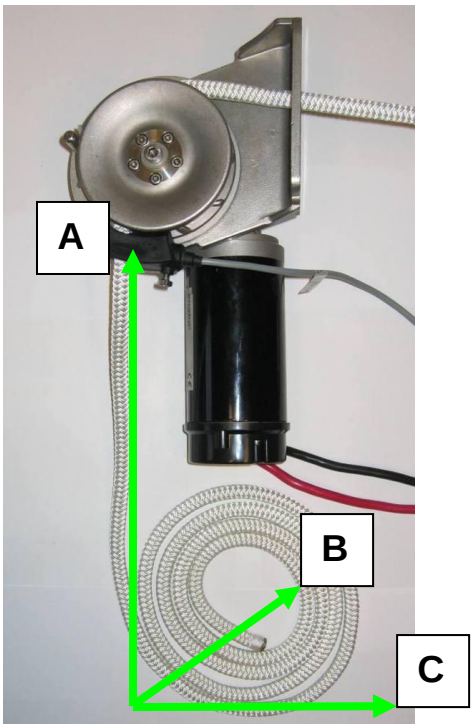
Minimum rope clearance - height under windlass



In order for the windlass to function normally, there must be a sufficient volume/height below the windlass for stowing the rope when the anchor is up.

The table below shows recommended minimum height **(A)** below the windlass as well as width **(B)** and length **(C)** of the area used for stowing the rope.

Rope dimension	A (cm)	B (cm)	C (cm)
10 mm x 30 m	35	30	30
12 mm x 30 m	35	30	30
12 mm x 50 m	40	35	35

NOTE! In case of installations where the rope is routed horizontally out of the windlass when the anchor up, the relationship between A, B and C may vary. It is important that there is a sufficient volume to ensure that the rope is not forced into place below the windlass and cannot easily be pulled out by the gypsy.

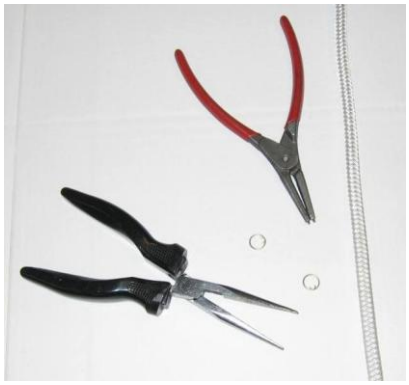
Installation of stop ring for auto stop

NOTE! Applies to MIDI 201 only

Under the rope guide there is an inductive sensor that signals auto stop when the anchor has been lifted all the way up. To activate the detector, two stop rings (included) are fitted on the rope. See procedure below. The outer diameter of the stop ring must be as close to the outer diameter of the rope as possible. This is necessary in order for the inductive detector to be able to detect correctly.

In order to place the stop ring at the correct location on the rope, lift the anchor until the thimble eye is 25-50 cm below the rope roller (reel in at slow speed for the last section), and mark the rope with a marker at the location of the inductive sensor. The anchor is then reeled in at low speed to the desired final resting position. Mark the rope once more by the detector and fasten the stop rings by the marks.

These stop rings will be exposed to wear by the gypsy, especially during large loads, and must therefore be inspected regularly. Replace damaged stop rings as needed.



Recommended tools:

- Keeper ring pliers
- Pliers
- Auto stop rings (steel rings enclosed)

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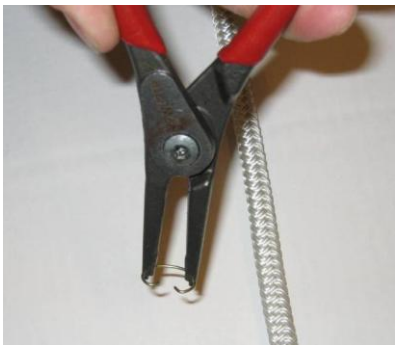
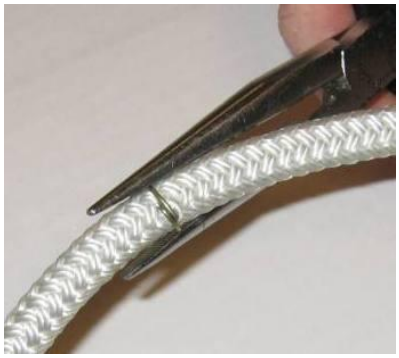


The enclosed steel rings (auto stop rings) are fitted in the locations where the windlass should slow down and then come to a full stop. Mark in advance; see procedure above.

Open the stop rings with the keeper ring pliers.

Fit the ring over the rope.

Use the pliers to pull the stop ring into place with the stop ring joint overlapping the opening and the ring fitted thightly around the rope.



Force the ends into the rope with the pliers to ensure the stop ring does not slip on the rope.

A fitted stop ring should look like this with close windings and the ends secured inside the rope.

Stop ring fitted and fastened tightly to the rope.

Fasten the other stop ring in the same manner.

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Battery replacement

The remote control uses three regular AAA/LR03 alkaline batteries. The battery lifetime is more than two seasons with normal use. When replacing batteries, open the unit by unscrewing all five screws.

Note! The screws are of different lengths and have O-rings under the screw heads.

Replace the batteries and make sure all point the same way with the + up and the – downwards towards the edge as illustrated.

Reassemble the back cover and carefully screw the parts together until the housing gasket is **slightly compressed**.

The impermeability of this unit depends on intact O-rings and intact gasket with the right compression.

Note! To ensure a long lifetime, this remote control has acid-proof machine screws and screw sockets in the housing. The screws may penetrate the housing if screwed carelessly or too much force is used. *(Not covered by the warranty.)*

Retrofit of remote control

If the remote control is purchased after the electronics unit, the electronics unit must be fitted with an antenna. The remote control and electronics unit must then be coded/taught electronically to communicate with each other.

Remove the left rubber cover (the one closest to the Engbo logo). Then push the antenna through the cover (on one side).

While holding down the handle, push the antenna all the way down into the bottom of the clamp. Release the handle and the antenna is fixed in place.

Replace the rubber cover. Start by pushing the rubber cover in by the antenna and continue around the endge until the cover is fixed in place.
Make sure not to twist the cover with the antenna.

(The remote control will function over short distances also without the antenna).

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Coding the wireless remote control

Image A

Image B

Image C

Image D

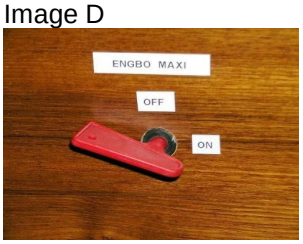
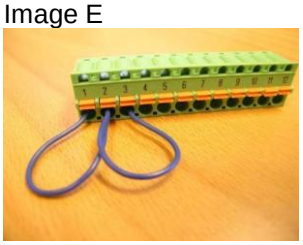


Image E



Procedure for wireless remote controls with serial no. above 8600

Important!
If your wireless control has serial no. lower than 8600, use the procedure enclosed your remote.
If coding a wireless control with serial no. above 8600 is to be coded to a receiver with Soft Ware of previous version be aware that the remote will be ready for operation after 10 sec.

How to put the wireless control unit in code mode:

- Select the pair of switches on the remote control to be coded.
- Press down both switches simultaneously for approximately 12 seconds. When you hear a short sound signal and the green power light starts to flash, **the remote control** is prepared for coding and will stay in coding mode for 5 minutes or until the coding has been finished.
  (Image A)

How to put the receiver unit in code mode:

Alt. 1. Touch panel installed.

- Press and keep both switches on the touch panel down while simultaneously switching on the power to the receiver unit.(Image B and C)
- The receiver will now understand that coding is requested and automatically connect to your wireless control and the wireless remote control will immediately be ready for use.
- This will be confirmed by a short sound signal and the green power light will turn from flashing to permanent.
- Check that the wireless control is functioning.

Alt. 2. Joystick installed.

- Turn the thruster main switch **off**.
- Disconnect the cables to the joystick connected to 1, 2 and 3 on the green plug on the remote control unit (RCU).
- Prepare two short wires (5 cm). Remove the insulation in both ends and connect these between 1 and 2 as well as between 2 and 3 on the green plug. (Image E).
- Turn the power **on**.
- The receiver will now understand that coding is requested and automatically connect to your wireless control and will immediately be ready for use.
- This will be confirmed by a short sound signal and the green power light will turn from flashing to permanent.
- Turn the thruster main switch **off**.
- Disconnect the short wires and connect the joystick cables.

Turn the power on and check that the wireless control is functioning.

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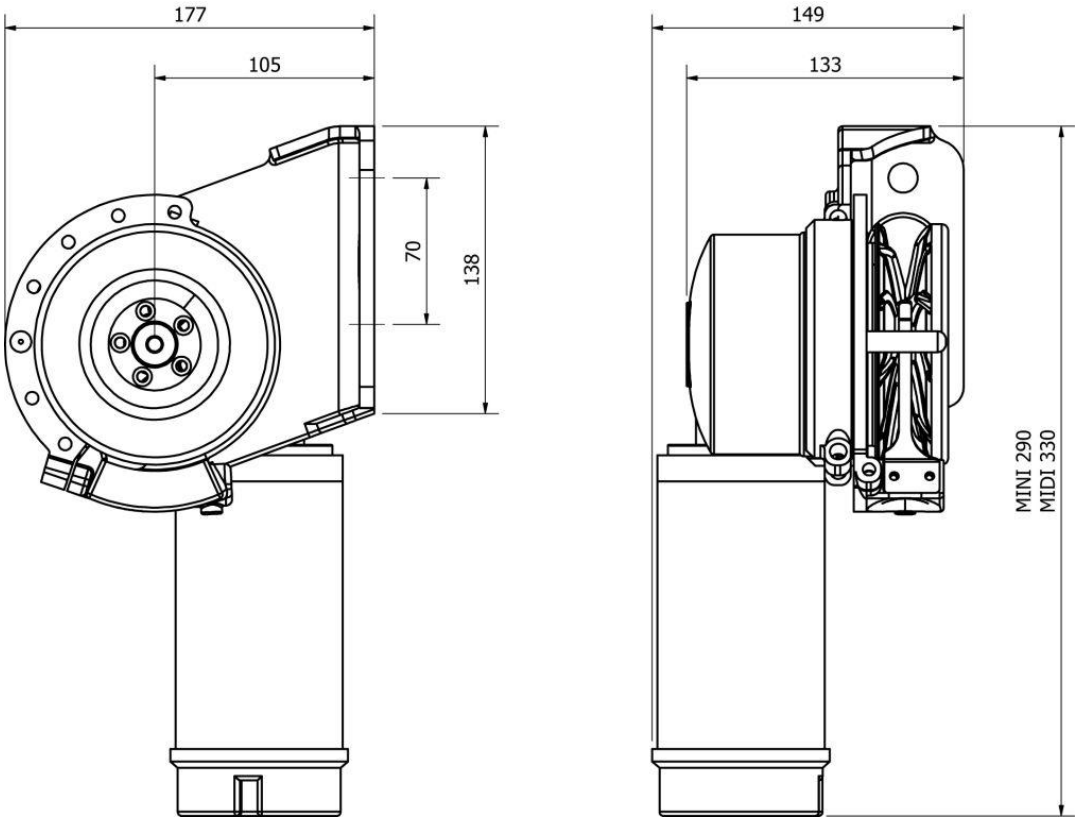
Maintenance

Winter storage

- Before winter storage, the windlass and all electrical terminals and connections must be coated with a moisture proofing spray.
- Make sure the windlass is protected against snow/rain during winter storage.
- To avoid condensation during winter storage, do not cover up the windlass.
- Remove the rope before winter storage. Soak it in mild soapy water overnight to remove remnants of salt and dirt. This will ensure that the rope remains supple for many years and simultaneously allows for checking and possible replacement of the auto stop rings.

If relevant, clean the rope locker on the inside and remove any seaweed, mud, etc.

Dimensioned drawings



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Technical data

	ENGBO – MINI 101	**ENGBO – MIDI 201**
Motor effect nom.	12 V DC/350 W	12 V DC/600 W
Rope	Braided lead rope: Dia 10 mm, 30 m Weight: 4.5 kg Breaking load: 1200 daN	Braided lead rope diameter 12 mm, 30/50 m Weight: 7.2 kg/12 kg Breaking load: 1600 daN
Maximum pull	Up to 100 kg (electronic limit)	Up to 200 kg (electronic limit)
Haulage speed	15-35 m/min approx. 20 m/min with 20 kg load	15-30 m/min approx. 20 m/min with 30 kg load
Current draw	10-150 A approx. 50 A with 20 kg load	10-200 A approx. 40 A with 30 kg load
No-load current	‹ 0.3 A at 12 V	‹ 0.3 A at 12 V
Recommended fuse	100 A	150 A
Recommended min. battery capacity	12 V/75 Ah	12 V/75 Ah
Weight: Windlass with motor cables	8.1 kg	9.8 kg
Weight: Control electronics	2.3 kg	2.3 kg
Auto stop function	No	Yes
Recommended anchor	5-8kg Bruce or plate	7.5-16 kg Bruce, plate or Engbo
Recommended vessel size	Max. 6.0 m (20 feet)	Max. 7.6 m (25 feet)
Installation	Vertical, hanging, forward or side (may require additional bracket).	Vertical, hanging, forward or side (may require additional bracket).
Standard equipment	MCU - Motor control unit, touch panel and main switch. Basic installation materials.	Windlass with end stop detector, electronic control unit, touch panel and main switch. Basic installation materials.
Optional equipment	Leaded rope Anchor (several types available) Anchor bracket (several types available) Shackles Wireless remote control Fuse and fuse holder Installation bracket(s) Battery cable	Leaded rope Anchor (several types available) Anchor bracket (several types available) Shackles Wireless remote control Fuse and fuse holder Installation bracket(s) Battery cable

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Trouble-shooting MINI 101 and MIDI 201

(For wiring, see for m under the section "Wiring)

	Symptom:	Action (please note the following):	Action results in:	Result
		NOTE! The main current switch **MUST** be turned off when connecting and disconnecting cables and peforming mechanical work		
1.	**The windlass is totally "dead". Nothing works.**	**Check that:** -the main switch is turned on, -the fuse is intact -all terminals have good contact -all connections are according to specs in the manual -there is sufficient current to the windlass motor. (See Item 3)		
2.	**The windlass will not drop the anchor, and only reels in for 3 s.**	**Check that:** -connections to 1, 2 and 3 are according to specs. By switching 1 and 3, the windlass should function correctly.		
3.	**The windlass does not work or pulls very poorly.**	**IMPORTANT!** **Based on previous experience, this is the most common problem.** 1.Look for main current faults: Measure the battery cable voltage at the input to the windlass while operating the windlass. 2. Adjusting the auto stop sensor: Disconnect the cables 4, 5 and 6 on the green plug on top of the MCU unit. Test the winch. If the winch now pulls normally, adjust the auto stop sensor 2 mm closer to the anchor line. Connect the cables to 4,5 and 6 and continue adjusting the stop sensor until the winch stops when the stop indicator on the line passes the sensor.	1. The voltage must be minimum 10.5 V when operating the windlass to ensure normal motor function. 2. Be aware that when disconnecting the cables 4, 5 and 6, the winch now will not stop automatically. The sensor must be located in the right distance from the anchor line to work normal.	**If** the voltage is below 10.5 V, the reason must be determined. Check all connections, e.g. main switch, fuse, battery terminals, battery voltage and the battery's general condition. **If** the voltage is higher than 10.5 V but the motor will still not run, the reason may be that extended use/overloading of the windlass has resulted in the electronic protection shutting off the motor. Wait 20 min. to let it cool down and try again. 2. When the auto stop sensor is adjusted correct, the winch will stop automatically when the stop indicator passes.
4.	**If the windlass still does not function.**	Disconnect cables to 1, 2 and 3. -------- Strip the insulation on the ends of a loose cable (approx. 10 cm) and establish contact between the following points: Cable between 2 and 3 Cable between 1 and 2	Functions that normally are controlled from the switch panel are disconnected to allow forced operation of the windlass directly from the electronics unit. -------- The windlass is released and the anchor dropped Windlass reels in.	The switch panel is disconnected. -------- If the windlass functions normally using this procedure, the fault is located in a cable to the switch panel, or the switch panel itself, which must be replaced.
5.	**If the auto stop does not function:** **(MIDI 201 ONLY)**	**Check that:** - Connections to 4, 5 and 6 are according to specs. - the current to the detector (between 4 and 6) is more than 10 V DC -the auto stop rings are in place.	The indicator lamp on the detector must light up when the metal ring on the rope is by the detector. (Can also be tested using a screwdriver, for example, by the detector)	If the current is OK and the lamp does not light, the detector must be replaced.

If the windlass still does not function normally after this procedure, the fault is located in the windlass itself. Contact the nearest dealer, or Engbo AS, Tønsberg. Tel. +47 33003150, Fax: +47 33003160, E-mail: support@engbo.no

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